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ABSTRACT

In the United States today Attention Deficit Disorder (ADD) is recognized by professionals as a distinct disorder, a neurobiological disability marked by inattentiveness, impulsivity, and hyperactivity. About 2-10% of school-age children suffer from ADD, making it an issue of rising concern to families and school leaders. It is necessary that physicians, teachers, parents, and health care personnel who work with ADD children be knowledgeable about brain function and its affect on behavior. Neurochemical models of ADD view it as a malfunction of the brain stem and deficiencies in the levels of neuro-transmitters necessary for sending information to other parts of the brain. There is much evidence that ADD is genetic. Though there are several psycho-medical disorders with symptoms that mimic ADD, technological advances in examining the brain aid in diagnosis. Some of the educational strategies in teaching children with ADD include a structured program, stimulus reduction, behavior modification, cognitive training, and psychopharmacology. Physicians play the pivotal role in provision of quality care and proper management of ADD; it is critical that they have a thorough understanding of this neurological disability. To effectively protect children's health requires a collaborative effort among physicians, parents, teachers, counselors, school administrators, and community. (Contains 20 references.) (LSR)

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ADD AND PHYSICIANS

by

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Frequently, the borderline between regular medical problems and ADD disorders leaves a blurred area which can create confusion in diagnosis and management because a strong strain of co-morbidity exists. Today a "new morbidity" hits the psycho-medico scene for children and adolescents relative to underachievement, developmental disabilities, psychosocial and behavioral disorders. With the inclusion of this "new morbidity" in the DSM- 1V-R., a new landscape emerges on the scene and it poses serious, challenging, and major implications for the role of physicians and the way they conduct their practices. In this regard, the physician is involved in caring, preventing, diagnosing, medicating, counseling, coordinating, advocating, consulting, and educating. Frequently, the borderline between regular medical problems and ADD disorders leaves a blurred area which can create confusion in diagnosis and management because a strong strain of co-morbidity exists.. To be adept in the foregoing, it ***might*** necessitate ***some*** retreading on the part of ***some*** physicians. Therefore, physicians should have a thorough understanding of this disorder and to provide quality care and proper management

BACKGROUND

In the United States, today, Attention Deficit Disorder (ADD) is recognized by professionals as a distinct disorder. About 2% to 10% of all children in our schools suffer from it. In 1985, a rather astonishing fact appeared in the **Mental Health Newsletter** published by the Harvard Medical School. It stated that half of all childhood referrals to mental health agencies were for ADD. According to Lavin (1991), "it has been estimated that nearly a million children are taking stimulant drugs" for this disorder.

Historically, Attention Deficit Disorder is characterized by attention skills that are developmental inappropriate, impulsivity, and in some cases, hyperactivity. It is a neurobiological disability that affects up to 5% of all American children. Until recently, it was believed that ADD symptoms disappeared in adolescence. It is now known that many symptoms continue into adulthood for 30-70% of individuals with ADD. Adults with ADD may experience difficulties at work and in relationships. They may also exhibit other emotional difficulties. Medical science first noticed children exhibiting inattentiveness, impulsivity, and hyperactivity in 1902. A significant percentage, perhaps as many as 50% of children with ADD are never properly diagnosed (CH.A.D.D.., 1993)

Further, during the 1950s, our schools were crowded with children who did not or could not pay

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attention. Educators began to focus upon students who were too easily distractible, could not tune out the edges of their environment, could not follow a series of simple instructions without being reminded, and could not fit successfully into a group.
Distractibility and short attention span became prominent topics at meetings where school leaders discussed their frustration. It is postulated that these children with ADD are becoming a liability to our society and more directly to their families.

CHARACTERISTICS

The clinical features of Attention- Deficit- Hyperactivity Disorders are as follows:

INATTENTION

1. Easily distracted by extraneous stimuli
2. Difficulty following through on instructions in the absence of close supervision (e.g., fails to finish schoolwork).
3. Difficulty sustaining attention in tasks or play activities.
4. Often does not seem to listen to what is being said to him or her.
5. Often loses things necessary for tasks or activities (e.g. toys, pencils).
6. Often fails to give close attention to details in schoolwork or other activities.
7. Has difficulty organizing goal-directed activity.
8. Often shifts from one uncompleted activity to another.

HYPERACTIVITY

1. Often leaves seat in classroom or in other situations in which remaining seated is expected.
2. Has difficulty playing quietly.
3. Runs about or climbs excessively in inappropriate situations.
4. Often fidgets with hands or feet or squirms in seat.
5. Often interrupts or intrudes on others.
6. Often talks excessively.

IMPULSIVENESS

1. Often acts before thinking.
2. Has difficulty awaiting turn in games or group situations.
3. Often blurts out answers to questions before they have been completed.
4. Often engages in physically dangerous activities without considering consequences (e.g. runs into street without looking.

ETIOLOGY.

A. NEUROCHEMICAL MODEL OF ADD.

It is thought that individuals with ADD do not release enough of the chemicals needed to send information from the brain stem to other parts of the brain (Goldstein and Goldstein, 1990). The brain is unable to produce enough of a family of neurostransmitters called catecholamines. The most important are the norepinephrine and dopamine. These neurotransmitters are thought to affect a wide variety of behavior, including the regulation of attention, inhibition, and motor responses. These may be involved in the transmission of such messages as:

"ignore distractions"
"stay focused"
"don't fidget"
"be efficient"
"reflect"
"don't overreact" (Busch, 1993).

Other areas of the brain thought to be implicated in ADDs are the :

1. prefrontal lobes--responsible for selective attention
2. the motor strip area--responsible for fidgetiness and overactive behavior.
3. the subcortical/limbic areas--thought to be responsible for poor pencil control, disinhibition and emotional over responsiveness. ***These abnormalities appear to be reversed by stimulant medication (Busch, 1993)***

B. CEREBRAL GLUCOSE METABOLISM

Zametkin (1990) , and his colleagues, NIH, showed that the brains of individuals with ADD metabolize glucose at a significantly slower rate.

C. ADD IS GENETIC

Family members of children with ADD commonly have symptoms of ADD. In one research study, hyperactivity was noted in the parents of hyperactive children four times as often as in those of the control group(Cantwell, 1972). In another study, it revealed that 20% to 32% of the parents of

children with ADD also had symptoms of ADD (Barkley, 1990). These studies demonstrate a genetic predisposition for attention deficit disorders. Further, according to L.B Silver (1992) the genetic theory of ADD is supported by the finding that the incidence of ADD in adopted children is higher than for biological children.Additionally, twin studies also support the genetic theory of ADD. Researchers at the University of Minnesota, conducted a large scale longitudinal study of twins who were reared apart. They studied the characteristics of twins to sort out which qualities of mind and body are shaped by genetics and were shaped by environment.The study compared that characteristics of identical twins, who have identical genes and with those of fraternal twins, who are not genetically identical. The study found that even when identical twins were reared apart, they had similar characteristics relative to hyperactivity. The researchers concluded that genetics or heritability plays a significant role in the characteristics of hyperactivity. The implication of the twin studies is that there is a genetic predisposition for ADD (Goodman & Stevenson, 1989).

D. CAUTION

A variety of disorders can be mistaken for ADD. Popper (1991) identifies the following "ADD look-alike" disorders:

1. Depression: some inattentive children with impulsive and hyperactive behavior may be suffering from depression. The depression may be temporary (feeling blue or demoralized\) or more persistent (dysthymic disorder) or severe enough to warrant a psychiatric diagnosis of depression. These individuals require treatment for depression not for ADD.

2. Stress-induced anxiety states: Environmental stress caused by home, school, or social situation may result in a state of anxiety. Though the symptoms may look like ADD, the source of the problem lies in the environment, and treatment must focus on helping the individual change the environment or cope with it more successfully.

3. Biologically based anxiety: Individuals with disorders such as separation anxiety or compulsive disorders may also have symptoms similar to ADD. However, stimulant medication may only worsen the symptoms of such disorders, for which other approaches and medications are needed.

4. Child abuse or neglect: Sometimes children respond to sexual abuse, physical abuse, or neglect with behaviors that resemble those of children with ADD. These problems too, must be distinguished from ADD, because they require vastly different treatment.

5. Bipolar disorders: Bipolar disorder include a group of biomedical conditions, of which manic-depression illness in adults is one of the most severe. Symptoms of bipolar disorders in children and adolescents include impulsivity, irritability, unprovoked hostility, and difficulty in getting going in the morning. Children and adolescents with severe bipolar disorders may display lengthy temper

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tantrums, grossly distorted views of the world, and dangerous destructiveness during their rages. Stimulant medication may worsen their symptoms and can be quite risky. Individuals with bipolar disorders may do better with other medications, such as lithium.

6. Schizophrenia: A few children with ADD symptoms may have the serious biomedical disorder of schizophrenia. Stimulant medications can be risky for these children, too, who need other treatments and medication therapy.

7. Other medical disorders: A number of other medical disorders can mimic ADD. These include disorders of sleep (or arousal), malfunctions of the thyroid gland, and excessive ingestion and lead. Again, a thorough diagnosis is needed to distinguish these symptoms from ADD.

DIAGNOSIS

There are several technological advances in studying the brain which aid in the diagnosis of ADD.

MRI--magnetic resonance imaging- research shows that the frontal region of the brain of dyslexic and ADHD individuals is symmetrical and smaller than that of normal individuals (Hynd, 1992).

BEAM--brain electrical activity mapping-- research has shown that the electrical activity of brains of individuals with dyslexia differs significantly from that of normal brains. Differences were found in the left hemisphere, the medial front lobe, and the occipital lobe which is the brain's visual center (Duffy, 1988).

PET--positron emission tomography- proved the most successful research approach in regard to ADD. PET imaging demonstrate that the metabolism of individuals with ADD is uniquely different from that of normal individuals.

EEG-- electroencephalogram- it is graphic record of minute electrical impulses arising from brain cells, and measured by an electronic device. In 1987, the Clinical Psychiatry News reported that computerized EEG distinguishes between Attention Deficit Disorder and depression, "providing compelling evidence that psychological dysfunction alone cannot explain many patients' conditions and that biological evaluation is necessary...Something is physiologically wrong."

INSTRUMENTS: Assessment of children with ADD requires bringing together all informaion affecting the child. It is a multidisciplinary task and one of much communicating among specialists. Some of the instruments used in this respect are: Case History and Interview, Behavior Rating Scales (Conners Rating Scale, Child Behavior Checklists, Behavior Problem Checklists, Attention Deficit Disorder Evaluation Scales (Home and School Versions), neurological tests, etc.

SOME EDUCATIONAL STRATEGIES

Since most children and adolescents are in a school setting, the undermentioned strategies are suggested by professionals who address the ADD question in the classroom.While physicians might not be engaged directly in teaching, it is necessary for them to be acquainted with academic strategies for this disorder and then be able to make informed referrals.

A. Structured Program. It is highly teacher directed in which activities and environment are structured for children who are hyperactive and distractible. The rationale for this approach is that children with ADD cannot make their own decisions until they are able to do so.

B. Stimulus Reduction. All irrelevant stimuli within the environment must be reduced to a minimum. It is achieved by soundproof walls and ceilings, carpeting, opaque windows, enclosed bookcases and cupboards, limited use of colorful bulletins, and use of cubicles and three-sided work areas.

C. Behavior Modification. This is a technique used to control inattentive behavior. The use of reinforcement (e.g. verbal praise,, extra time on the computer) to increase attentive behavior and punishment (reduced for recess) can have powerful effect on behavior.

D. Cognitive Training. This approach is intended to assist students to take control of their behavior. By thinking about their behavior, students can regulate their impulsive and inattentive behavior. A good technique in this respect is self-monitoring. It is a procedure that requires the student to keep track of his or her behavior.

E. Psychopharmacology. Research show that medication treatment is effective for 70% to 80% of children who were carefully diagnosed with ADD. Some of the most frequently used stimulant medication methylphenidate (Ritalin)' pemoline (Cylert), and dextroamphetamine (Dexadrine) can help the ADD child's nervous system function more normally by increasing attention span and reducing over activity and distractibility. Further, counseling can be of great help in terms of behavior modification, environmental adjustment, cognitive training, and stress management for child and parent(s).

In sum, physicians play a conspicuous role in the caring and remediation of our children, the future of our society. The quality of our children's health will have a rather pronounced effect on the quality of our future society. The physician is an indispensable factor in this equation. It is necessary and even mandatory that physicians, teachers, parents, and health care personnel who work with children suffering from ADD should be knowledgeable about the brain and how variations in brain function affect behavior. Parents and teachers are often called upon to provide feedback to physicians about the

effectiveness of medication. It is a collaborative effort among physicians, parent, teachers, counselors, school administrators, and community.

Neuroscientists generally agree that attention deficit disorders are neurobiologically based. There are several theories about the neurobiological origins of ADD, many of which involve neurochemical dysfunctions. Neurochemical models of ADD view attention deficit disorders as due to malfunction of the area of the brain called the brain stem and deficiencies in the levels of neurotransmitters necessary for sending information from the brain stem to other parts of the brain.

New technologies for examining the brain include magnetic resonance imaging (MRI), brain electrical activity mapping (BEAM), electroencephalogram (EEG), and positron emission tomography (PET). It is the PET research conducted by Zametkin and his colleagues that has been most productive, showing that the brains of individuals with ADD metabolize glucose at a significantly slower rate.

There is much evidence that ADD is genetic. Family members of children with ADD commonly have symptoms of ADD. Twin studies also demonstrate that heritability of ADD.

There are several psycho medical disorders with symptoms similar to ADD's. They include depression, stressed-induced anxiety states, biologically based anxiety, child abuse or neglect, bipolar disorders, and schizophrenia, among others.

Finally, some of the educational strategies in teaching these children involve a structured program, stimulus reduction, behavior modification, cognitive training, psychopharmacology etc..

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